

# Cold x Flu x Infections

## Respiratory diseases

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**PharmDr. Alena Petříková**



INVESTICE DO ROZVOJE VZDĚLÁVÁNÍ

# What will you learn today?

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- **Patient counselling** in self-medication
- Treatment of symptoms of flu or „flu-like syndrom“:
  - Rhinitis
  - Sore throat
  - Cough
  - Fever
- Children; pregnancy

# What is the difference?

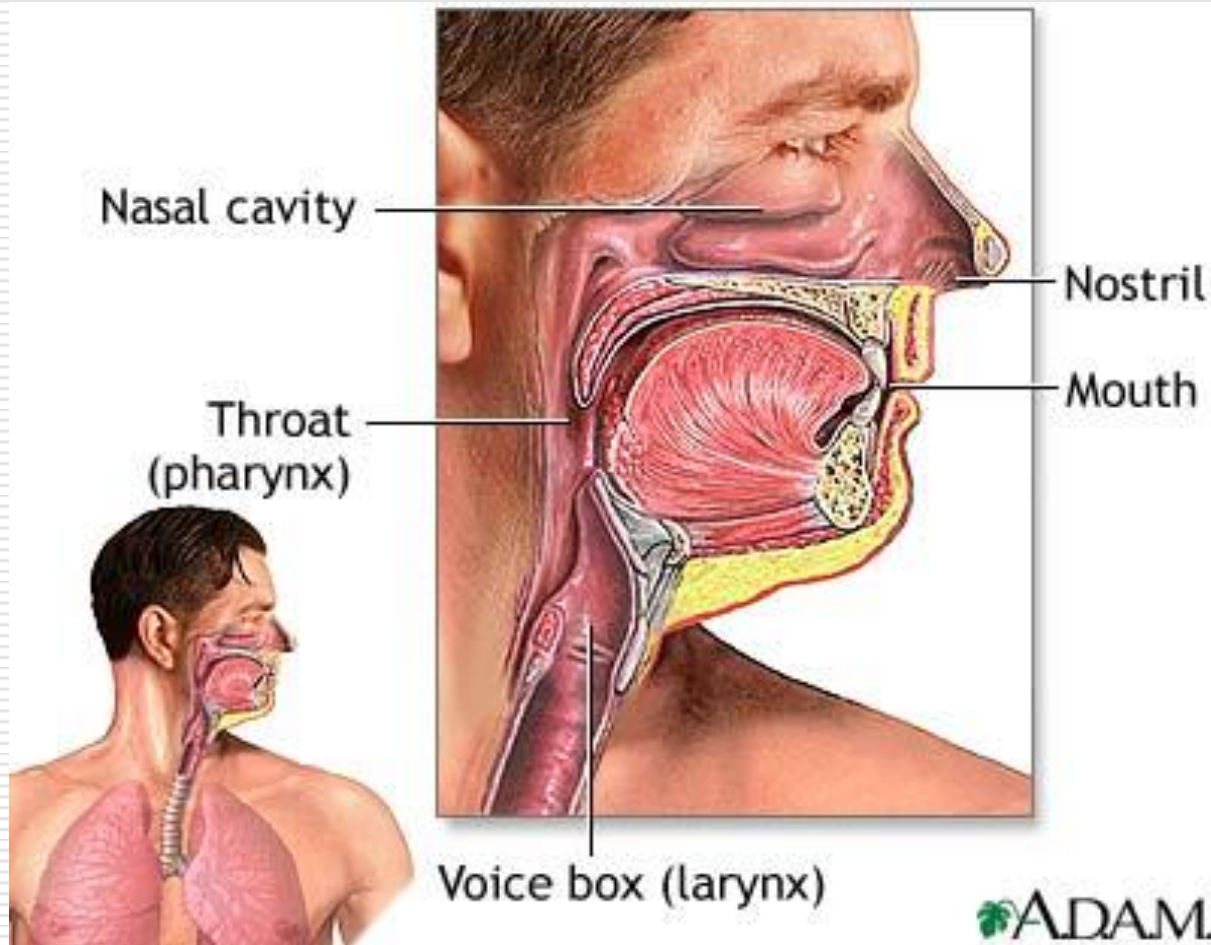
- Common cold
- Flu
- Bacterial infections
  
- What are the symptoms?

# Upper respiratory tract infection - what all does this include?

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- Rhinitis
- Rhinopharyngitis
- Tonsilopharyngitis
- Laryngitis acuta
- Epiglottitis acuta
- Difteria (black cough) etc.

# Upper respiratory tract



# Etiology

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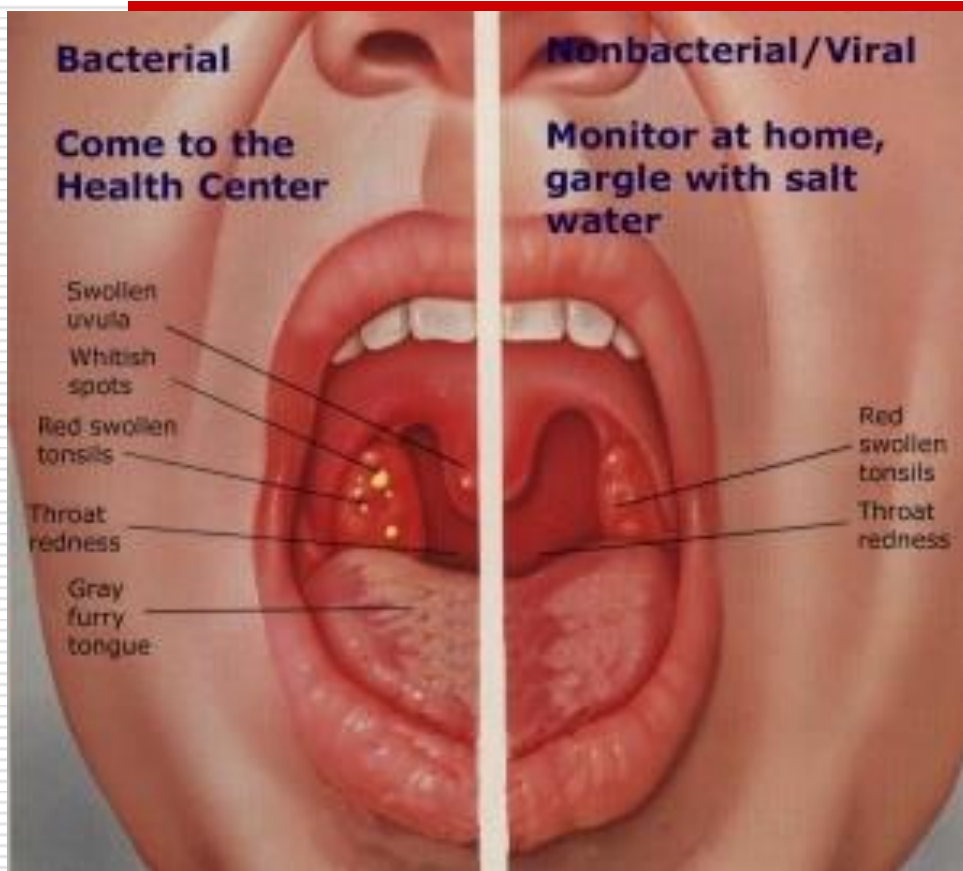
## *Viral*

- rhinitis ac., rhinopharyngitis ac., **tonsilopharyngitis ac., sinusitis ac., otitis media ac.**, laryngitis subglottica

## *Bacterial*

- **tonsilopharyngitis ac., sinusitis ac., otitis media ac.**, epiglottitis ac.

# The division of symptoms and findings of streptococcal and viral tonsillitis



# Flu

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- Patient, 35 yrs, is coming to your pharmacy complaining about having a flu.
- What will you ask him? How will you help him?



# Flu

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- ❑ Myxovirus influenzae type A, B, C
- ❑ Large pandemic caused by type A only

# Symptoms?

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- ❑ Incubation of 18 -24 hours
  - ❑ Fever of 38 to 40 °C,
  - ❑ chills, arthralgia, myalgia, generalized fatigue and exhaustion,
  - ❑ a dry cough 1-2 days
- 
- ❑ Patient can hardly wake up from his bed!

# Flu – duration

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- ❑ Duration 4 to 7 days
- ❑ Complications of pneumonia, karditidis, otitis
- ❑ Caution – children and elderly (cardio and pneumo illnesses!)

# Therapy?

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- Bed rest
  - Hydration
  - Antipyretics
  - NSAIDs
  - Antitussives
- 
- Neuraminidase inhibitors - zanamivir, oseltamivir

# Flu - treatment

## **Oseltamivir (Tamiflu tablets., Inj.)**

### **Indication**

Treatment of influenza in patients (older 1 year) who present with symptoms typical of influenza at the time of its occurrence in the population. Efficacy has been demonstrated when treatment is initiated within 2 days after onset of symptoms.

### **Treatment**

75 mg (1 capsule) 2 times daily for 5 days

# Flu - treatment

## **Zanamivir (Relenza inh. Plv.)**

### **indication**

Treatment and prophylaxis of influenza type A and B in adults, adolescents and children aged 12 years.

### **treatment**

2 inhalations (10 mg) 2 times daily for 5 days. The maximum effect is achieved by treatment with the administration of the first signs of influenza illness, preferably within the first 2 days.

# Flu - vaccines

## **Method of administration:**

The vaccine is administered intramuscularly, usually into the deltoid region.

As with all products of biological nature can not be ruled manifestation of hypersensitivity to any component of the vaccine and therefore when vaccinating a dilution of 1:1.000 epinephrine or corticosteroids should be available to reduce the symptoms of these reactions arising immediately after vaccination.

For this reason, should be vaccinated person under the supervision of a physician 30 minutes after administration of the vaccine.

# Flu - vaccines

Influenza vaccines usually have shelf life *12 months* when stored in the refrigerator in an intact container at a temperature from +2 ° C to +8 ° C.

The vaccine should be protected from light.  
The vaccine should be shaken thoroughly before use and visually inspected for any foreign particles.

The vaccine should be consumed within 8 hours after unpacking the container.



# Vaccines' Reimbursement from health insurance - a partial reimbursement

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- individuals over 65 years
- Severe chronic respiratory and cardio-vascular disease
- With diabetes mellitus and other metabolic diseases
- With cystic fibrosis, chronic renal insufficiency, chronic anemia
- Congenital or acquired disorders of immune diseases (eg HIV infection, treatment with immunosuppressants, cytotoxic agents or high doses of corticosteroids, radiotherapy, etc.)

# Flu – vaccines Contraindication

- Persons with **acute febrile illness** should not be vaccinated until at least 2 weeks after full cure.
- Known **severe allergic reaction** (eg egg protein) at least one component of the vaccine is a contraindication for vaccination against influenza.
- If after immunization of **complications occur**, then the next dose immunization of the same vaccine is contraindicated in the meantime until they are clarified causes of this complication.
- **First trimester** (or first half) pregnancy is a contraindication for vaccination against influenza; in the **2nd and 3 trimester** is possible that vaccination, especially if it is assumed that a pregnant woman is exposed to potential risk of infection during an influenza epidemic.



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# Rhinitis, sinusitis

# Rhinitis

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Young woman is coming to your pharmacy asking for something effective for runny nose.

What questions will you ask her?

# Rhinitis

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## **Rhinitis symptoms**

- inflammation of the nasal cavity.
- Itchy nose and sneezing
- Swollen nasal mucosa
- Runny nose

## **Categories:**

- allergic (perennial, seasonal)
- Infectious (bacterial virus x)
- Other (eg, iatrogenic, geriatric, idiopathic - heat\cold)

# Rhinitis

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- 98% of viral origin!!!
  - What does it mean???
  
- Chronic and recurrent, often **allergic**
  
- Only 0.5-2% bacterial complication
  - How does it look?
  
- Geriatric rhinitis

# Alergic Rhinitis

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- ❑ Cause: herbs, dust, animals, ....
- ❑ Distinguish between viral and allergic rhinitis – different treatment!
- ❑ Treat the one you are able to treat in the pharmacy- OTC!

# Sedative antihistamines

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- bisulepin → Dithiaden
- dimetinden → Fenistil
- azelastin → Allergodil
- promethazin → Prothazin



# Non-sedative antihistamines

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- cetirizin → Zyrtec, Zodac...
- loratadin → Claritin, Flonidan...
- levocetirizin → Xyzal
- desloratadin → Aerius

# Geriatric rhinitis

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- ❑ Narrowing of the airways
- ❑ Loss of mucosal glands
- ❑ Changes in the microcirculation - drying
- ❑ It is accompanied by gastroesophageal reflux
- ❑ Diuretics, antihypertensives,  $\beta$ -blockers, anxiolytics, antivertiginosa

# Therapy of geriatric rhinitis

- ❑ Humidification of air in the nose
- ❑ Mucolytics
- ❑ Antihistamines -2nd generation
- ❑ Decongestants **contraindicated**, especially sprays!
  
- ❑ Sleeping with the head supported
- ❑ Do not eat, drink before bedtime

# Rhinitis - general recommendations

- Nasal decongestants- possible to use oxymetazolin (Nasivin, Oxamet), xylometazolin (Olynth, Otrivin), nafazolin (Sanorin)
- Local treatment (nose drops, spray) preferred to systematic treatment (tablets)
- Nose sprays are generally considered to be more suitable and gentle than nasal drops
- Usage: no longer than 1 week
- Pregnant woman with pregnancy hypertension should avoid these remedies!
- Every remedy dries the mucosa although advertisement says the opposite!

# Drug formulations

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Formulations:

**Drops**

**Sprays**

What are the benefits for the patient?

What are the obstacles in using certain formulation?

# Decongestants

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## How do they work??

- Sympathomimetics
- Osmotically active

# Decongestants - sympatomimetics

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- ❑ **xylomethazolin** (OLYNTH, OTRIVIN)
- ❑ **oxymethazolin** (Nasivin) - for babies 0-1 years
  - For children 1-7 years
  - For adults
- ❑ **Naphazoline** (Sanorin)
- ❑ **dimetinden + phenylephrine** (Vibrocil)
- ❑ **carbethopendecinium bromide** (Mukoseptonex) - only disinfection effect
- ❑ **carbethopendecinium bromide + Ephedrine** (E Mukoseptonex - only Rp.)
- ❑ **Pseudoephedrine** (Modafen), **phenylephrine** (Cold







# Sympathomimetics

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- The possibility of addiction - take 4 -7 days only!!
- Drying of mucous membranes
- ↑ blood pressure, tachycardia, mydriasis
  
- Addictive – **REBOUND PHENOMENA!!**
- How to loose the addiction?
- How to restore normal function of nasal mucoses?
- How lond does it take?

# Sympathomimetics

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## Contraindications!

- ❑ CI of spray in children under 2 years, cardiovascular diseases, glaucoma, thyreosis, iMAO (antidepressants)
- ❑ CI pseudoephedrine: diabetes, pregnancy, up to 12 years

# Osmotically active

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= Hypertonic saline solutions

- ❑ ↓ congestion of nasal mucosa (decongestion)
- ❑ ↑ mucin secretion => restoration of the natural protection of the mucosal
- ❑ improved motility of cilia - synchronization and frequency





# Rhinitis in pregnant women

## YES

Sprays with sea water (e.g. **Sterimar**), **Vincentka spray** or **Pinosol nose drops** and nose unguentum containing etheric oils.

## NO

There are also drugs available in tablet form. Examples are products **Modafen**, **Nurofen stopgrip**, **aspirin plus Coldrex** etc. These contain a combination of several active compounds depressing cold, cough and high temperature.

Using a combination of several substances in pregnancy is not considered ideal, and generally are not recommended.

# Questions to be asked

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- How long do you have the runny nose?
- What and for how long have you already used?
- Are you allergic to anything? (Alergic rh.)
- Which other symptoms do you have?
- Think about contraindications! (HT, DM, glaucoma, pregnancy...)
- How old is the patient? (children, elderly)

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# Sore throat



# Sore throat

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Where is it localised?

## **Diagnostics**

- the nature of pain + its duration
- The circumstances of its formation and degradation
- Accompanying symptomatology
- shortness of breath
- temperature
- Swollen tonsils

# Sore throat

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## What do we ask?

- What is the nature of pain?
- How long does the pain last?
- The circumstances of emergence of pain in the neck.
- Getting worse?
- What are the accompanying symptoms?
- Hyperthermia is present?
- It is visible swelling in the neck?
- What were the attempts at self-medication?

# Sore throat

## When to be sent to a doctor:

1. The patient **cannot eat** and have problems with fluid intake.
2. The pain lasts longer **than three days** and is accompanied by **high fevers**.
3. Pain in **children** is accompanied by fever and lasts longer than two days.
4. **Redness of the neck** is visibly red or white plaque is visible, or are "swollen" tonsils.
5. For small children is very dangerous epiglottitis!

# Sore throat - therapy

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## Tonsilitis

Acute bacterial inflammatory disease are indicated to treat with antibiotics according to causal sensitivity.

The empirical antibiotic treatment of angina is still the drug of first choice recommended by the V-Penicillin

Macrolide antibiotics are indicated only when a contraindication beta-lactam antibiotic therapy (allergy), as is currently observed higher resistance of pathogens causing angina to macrolide antibiotics.

# Sore throat - therapy

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## GARGLES - KLOKTADLO

### - salinic

- **Vincentka** (min. water spray, lozenges)
- "**Powder**" (magistral preparation)

### - Containing iodine

- **Sol. jodi glycerolica**
- **Iodopovidonum**

- **Jox sol.** - Must know how to use (diluted in a ratio of 1:20 or 1:40 potable water, ie, 2.5-5 ml according to the enclosed measuring cup or 1/2-1 teaspoon to 100 ml of water).

- **Betadine sol.** - Uses a 10% concentration

# Sore throat - therapy

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## GARGLES

- **Hexetidin** (Stopangin sol.) - Used undiluted
- "**Kutvirtovo kloktadlo**" - magistraliter preparation, contains formaldehyde, dilution - 20 drops in glasses of water
- 3% solution of **hydrogen peroxide**
- **Benzydamiini hydrochloride**. (Tantum verde sol.) - used undiluted



# Sore throat - therapy

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## Sprays

- **hexetidin** (*Stopangin spray*)
- **benzydramini hydrochl.** 0,15% (*Tantum verde spray*)
- **benzydramini hydrochl.** 0,3% (*Tantum verde forte spray*)
- **iodpovidonum** (*Jox spray*)



# Sore throat - therapy

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## sprays

- **Fusafungin** (Bioparox spray)
  - Local antibiotic therapy
  - Suitable for stronger pain (caused by bacterial infection)
  - Administered four times daily in the oral cavity



# Sore throat – therapy **LOZENGES**

-Containing substances with a disinfectant effect

- **chlorhexidinum** (*Septofort*)
- **aminotridecain adipate** (*Septisan*)
- **dichlorbenzenmethanolium + amylmetacresolum** (*Strepsils*)
- **benzydamine hydrochl.** (*Tantum verde P*)
  
- **dichlorbenzenmethanolium + amylmetacresolum + menthol** (*Neo Angin*)
- **hexylresorcinolum + benzalkonii chloridi** (*Coldrex proti bolesti v krku*)



# Sore throat – therapy **LOZENGES**

## -disinfectant + a **local anesthetic** effect

- chlorhexidin + **tetracain** (*Drill*)
  - dichlorbenzenmethanolium + amylmetacresolum + **lidocain** (*Strepsils plus*)
  - benzoxonium chlorid + **lidocain** (*Orofar*)
  - Chlorhexidin + **benzokain** (*Hexoraletten*)
- 
- KI? (cardio, thyreosis, allergy, DM)
  - Patient counselling??



# Sore throat – **LOZENGES**

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## Herbal lozenges

- Honey
- Salvia
- Thyme
- Lichen islandicus



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# Sore throat - pregnancy



## YES

- Can be recommended **tridekanamin adipate** (Septisan lozenges), **chlorhexidine** (Septofort lozenges)
- Suitable and stronger pain is often used **fusafungin** (Bioparox spray)
- **Salinic gargle** (Vincentka, powder gargle)

## NO

- Avoid products containing **local anesthetic** (Drill lozenges, Strepsils Plus lozenges, pastilles Orofar, Septolete)
- Do not use products with **iodic povidone** (Jox, jodglycerin)
- Preparations containing **sage** (*Salvium officinalis*)

# Hydratation

## Tea mixtures

- Tilia cordata*
- Sambucus niger*
- Plantago*
- Thymus serpyllum*
- Thyme off.*
- Verbascum off.*
- Tussilago
- Anise
- Fennel
- Licorice
- Marjoram
- Meadowsweet



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# Cough

# Types of cough??

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**Productive**                      x                      **Dry**

How do they sound?

Names of medicines?

**Expectorancia**                      x                      **Antitussics**

# Cough: patient counselling

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## **What are the necessary questions to be asked?**

Is it for you?

How does the cough sound? (wet x dry)

How long does it take?

When is it?

What are the other symptoms?

What have you already taken?

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# Expectorantia

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- Mucolytics
- Secretolytics
- Secretomotorics

# Mucolytics

## **Bromhexinum, ambroxolum**

- ↑ secretion of surfactant
- thinning secretions
- activation of the ciliary epithelium

## **Patient counselling!**

ADRs GIT, possibility of allergies,

Usage after eating, importance of hydration





# Secretolytics

## **N-acetylcystein, carbocystein**

- cleaves the disulfide bonds of mucus glycoproteins
- antioxidant effect

## **Patient counselling!**

- ADRs headache, allergies
- KI asthmatics
- Detoxification of paracetamol poisoning

# Secretolytics

## Erdosteinum

- cleaves the disulfide bonds
- antioxidant effect
- prodrug »↓ GI irritation
- anti-inflammatory effect
- ↑ efficacy of antibiotics



# Secretomotorics

- Menthae piperitae etheroleum
- Anisi etheroleum
- Pini pumilionis etheroleum
- Eucalypti etheroleum

# Other expectorancia:

- Emetin
- Kalii iodidum
- Bromoform
- Amonii chloridum
- Guaifenesin

# Expectorantia in Pregnancy



## YES

In more serious manifestations of cough and phlegm is relatively safe alternative therapy administered **acetylcysteine** (ACC Long, ACC 200, NAC AL 600)

**Ambroxol** is used to treat disorders of surfactant in the fetus and is considered a relatively safe alternative.

On physician's recommendation for a limited time you can also use products containing **bromhexine**

## NO

Conversely **guaifenesin** (eg broncho Codrex syrup Guajacuran tbl.) Should not be used in the first trimester and is not recommended even in other periods of pregnancy





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# Antitussics

- Codeine-type
- Non-codeine type

# Antitussics

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## Formulations:

- Tablets
  - Sirupus
  - Solution
- 
- What is the most suitable for children?

# Codeine type antitussics

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- ❑ It acts in the brain stem
- ❑ Codeine, ethylmorfin, dextromethorphan
  
- ❑ Interaction:
  - SSRIs (fluoxetine, paroxetine),
  - MAOIs (moclobemide, selegiline, St. John's worth)
  - AB

# Codeine type antitussics

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## Patient counselling

- Usual use to reduce night cough
- Addictive!
- Use only for necessary time!
- Contraindicated in wet cough!
- Concentration decrease!



# Non-codeine type antitussics

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- Local anesthetic
- Butamirate, dropropizin
  
- Contraindication pregnancy (1st trimester)
- ADRs in GIT



# Non-codeine type antitussics

## Pregnancy



- You can use **dextromethorphan** (contained in the product Humex syrup, Robitussin syrup antitusikum)
- **Codeine** is considered in this indication as well as safe drug
- Preparations containing **butamirate** (Tussin, SINECOD) can be used with the exception of a short first trimester, when its administration is contraindicated
- for other drugs there is not enough experience and manufacturers do not recommend them for pregnant women



# Herbal remedies in pregnancy



It should be noted that the views that all vegetable and natural is safe for pregnant women, have long been overcome!

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The sore throat is often recommended **sage (Salvia off.)** during pregnancy should not be used! Sage was found to be harmful to the fetus and may have a teratogenic effect!

The pregnant patient should consult a pharmacist in the selection of tea mixture (or bronchial cough).

Safe as the use of lime tea (Tilia), melissa, plantain.

**Echinacea** can be used short term, but some of the alcohol extracts contain relatively high alcohol content.

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# Fever

# Fever

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When the body temperature higher than 39 °C should be promptly initiated therapy!

Higher temperature – **hyperthermia** – till 38 °C  
**Hyperpyrexia** – above 38 °C

**To treat or not to treat??**

Pregnancy:

Shown that there is a much greater risk when untreated high temperature than with antipyretics!

# Fever – possibility of treatment

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Most frequent medicines:

**paracetamolum**

**ibuprofenum**

**acetylsalicylic acid**

naproxenum

diclofenacum

# paracetamol (Paralen, Panadol, Medipyrin)

- 
- paracetamol crosses the placenta
  - After his administration - an increased risk of malformations or adverse effects was not observed during the first trimester.
  - The recommended safe dose of 3 x 500 mg daily
  - It is advisable tablets and suppositories
  - Risk only when the mother's overdose, because there is a failure of fetal liver
  - CI – I. Trimester, alcohol, liver problems

# Acetylsalicylic Acid (Acylpyrin, Anopyrin, Superpyrin, Aspirin)

- Evidence of a teratogenic effect of aspirin administered in high doses in the medium during the second. and III. trimester (500-1300 mg / day) was not confirmed
- Adverse effects of aspirin result from inhibition of cyclooxygenase and the subsequent decreased production of prostaglandins
- When taken during the third trimester, the fetus may cause premature closure of the ductus arteriosus to prolong pregnancy and increased risk of bleeding during childbirth for both mother and neonate
- CI – children till yrs, gastric ulcer, bleeding, alcohol, AB, CHOPN, III. trimester

# ibuprofenum (Ibalgin, Nurofen, Brufen)

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- In the short-term use of ibuprofen in the first and second trimester, the incidence of adverse effects and the possibility of developmental defects very small
- Increased incidence of persistent pulmonary hypertension of the newborn and a higher probability of abortion only during the regular and prolonged use
- In the third trimester should be more careful, especially during the anticipated delivery
- If you must be administered during pregnancy drug from the group of NSAIDs with strong antipyretic effect as ibuprofen drug of first choice
  - (recommended to prefer him before acetylsalicylic acid)
- Can be used with hyperthermia unresponsive to paracetamol

# naproxenum (Nalgesin)

- 
- Although it is primarily used to treat inflammatory diseases, may in some cases be used as an antipyretic.
  - Naproxen passes through the placenta
  - For naproxen, as the sole representative of a group of NSAIDs have been shown when used by women during pregnancy increased the incidence of cleft palate in newborns
  - **Contraindications throughout pregnancy!!!**



# diclofenacum

- diclofenac easily passes the placental barrier and the highest penetration was recorded during the first trimester of pregnancy.

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- at high doses can lead to accumulation of diclofenac in tissues of the fetus and the teratogenic risk is significantly increased. In this period, therefore the potential risk of teratogenic effects on the fetus and the highest diclofenac should not be administered during embryogenesis.

- occasional low doses has not been any studies confirmed teratogenic effect of diclofenac and legitimate indications it can be used during the second and the first half of the third trimester.

- at the end of the third trimester of pregnancy are generally of the side effects described in the risk of premature closure of ductus arteriosus fetus, delayed delivery, increased bleeding during and persistent pulmonary hypertension.

# Summary

<b>Name</b>	<b>1. trimester</b>	<b>2. Trimester</b>	<b>3. trimester</b>	<b>Before birth labor</b>
<b>Acetylsalicylic Acid</b>	<b>NO</b>	<b>NO</b>	<b>CI</b>	<b>CI</b>
<b>Diclofenacum</b>	<b>KI</b>	<b>NO</b>	<b>NO</b>	<b>CI</b>
<b>Ibuprofenum</b>	<b>NO</b>	<b>YES</b>	<b>YES</b>	<b>CI</b>
<b>Naproxenum</b>	<b>CI</b>	<b>CI</b>	<b>CI</b>	<b>CI</b>
<b>Paracetamololum</b>	<b>YES</b>	<b>YES</b>	<b>YES</b>	<b>YES</b>

# Flu and cold

Does not represent for a woman or a child for an extremely high risk, but just the fact that women treat themselves may pose a hazard.

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Risk factor in pregnancy are:

1. hyperthermia
2. long and irritating cough is an exhaustive factor for the whole organism mothers
3. fever may be complicated as sinusitis

# Vitamine supplements

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- Daily dose of vitamin C during pregnancy should not exceed 500 mg
  - Recommended the soluble (effervescentní tablets), because they can cause stomach irritation
  - Should be used only the multivitamin preparations, which are primarily intended for use in pregnancy

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# Other treatment options

# Other treatment options

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- Echinacea
- Vitamine C
- Zinc, selenium
- Propolis

# Conclusions

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- ❑ 80% of disease of viral origin
- ❑ Rational therapy - not antibiotics
- ❑ Symptomatic treatment
- ❑ Regime measures, hydration, stop smoking

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# Patient counselling examples



# Example 1

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- Young man is coming to pharmacy and asking a strong effective medicine for flu. He doesn't have time to stay in bed, he must go to work tomorrow.
  
- What questions do you ask?
- What are his symptoms?
- Which medicine would you recommend?
- What are the treatment measures?

# Example 2

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- Middle age woman is coming to pharmacy and is complaining about never-ending rhinitis. She wants something very effective in order to finally get off the runny nose.
  
- What questions do you ask?
- How long does the rhinitis take?
- Which medicines is she using?
- What should she do to fight the rebound phenomena?

# Example 3

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- A young father was sent to pharmacy to pick up a anti—cough sirupus for his 4 year daughter.
  
- What questions do you ask?
- What kind of cough is it?
- How long does it take?
- Are there any other symptoms?
- Did they use anything else before?
- What are the treatment measures?

# Example 4



- A pregnant women would like to have something for flu. She is very worried about the health of the unborn child.
  
- In which trimester of pregnancy is she?
- What are the symptoms?
- Did she use anything else before?
- What is suitable for 3rd trimester of pregnancy?
- What are the treatment measures?